

During the breeding season at Taolimiao-alashan Nur more than 85% of the local bird community is comprised of Mongolian highland desert birds, of which the Relict Gull is undoubtedly the dominant species, at least numerically.

At Aubai Nur there were only five species of breeding waterbirds in 1991 and, although there were slightly fewer Relict Gull pairs than there were Gull-billed Terns (624: 680), the former was in a dominant position because it occupied the best nest-sites.

Number of nests of waterbirds in different habitats at Aubai Nur in 1991

| | islet | shoal | lake shore | sand dune |
|---|-------|-------|------------|-----------|
| Ruddy Shelduck <i>Tadorna ferruginea</i> | | | + | |
| Common Shelduck <i>T. tadorna</i> | | | | + |
| Pied Avocet <i>Recurvirostra avosetta</i> | | ++ | | |
| Relict Gull <i>Larus relictus</i> | +++++ | | | |
| Gull-billed Tern <i>Gelochelidon nilotica</i> | +++ | | ++++ | |

+++++ more than 600 nests, ++++ 400-500 nests, +++ 200-300 nests, ++ 10-20 nests, + less than 10 nests

The Relict Gull is a typical bird of the Mongolian highland deserts and shows high adaptability to this type of habitat.

Relationship between the Relict Gull and the Gull-billed Tern

The Gull-billed Tern appears to be closely associated with the Relict Gull at the Ordos lakes, both with the breeding colonies and with non-breeding individuals. The tern is more catholic in its choice of nest sites, some pairs nesting on the lake shore or on off-shore shoals. The dominant Relict Gull had a significant effect on the population of the tern. At Taolimiao-Alashan Nur in 1990 the ratio of gulls' nests to terns' nests was 581 to 77 (Zhang Yin-sun *et al.* 1992). In 1991 the ratio was 491 to 286, after the first colony of Relict Gulls on islet B abandoned their nests following disturbance by an Upland Buzzard *Buteo hemilasius*. Soon after this the islet was occupied by Gull-billed Terns and a colony was quickly established. On islet E only two pairs of gulls nested and these eventually abandoned the islet to the terns. At Aubai Nur there were more terns than gulls nesting in total but, on islets, there were three times as many pairs of gulls as there were terns.

The two species do not compete for food resources because the Relict Gull feeds mainly on aquatic insects, whereas the Gull-billed Tern feeds on lizards and small fish.

As already mentioned, the Relict Gull dominates in nest-site selection and the arrangement of colonies of the two species on islets (Figures 3 and 4). The terns allow gulls to nest within their established colonies and benefit both species by their rapid and concerted reaction to predators.

Gull-billed Terns are also found at other breeding, or potential breeding, localities of the Relict Gull: Wuliangsu Hai and Suoguo Nur (Zhang Yin-sun); Lake Alakul, Russia (Knystautas 1987); Tatsain Tsagaan Nuur, Mongolia (Fisher 1985); Orok Nor, Mongolia (Kitson 1980, Vaurie 1964).

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Birds of Sariska Tiger Reserve, Rajasthan, India

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Sariska Tiger Reserve (76°17'-76°34'N and 27°5'-27°33'E), situated in the Aravali hill range, is located in the district of Alwar, Rajasthan. Sariska is in the semi-arid part of Rajasthan (Rodgers and Panwar 1988). The tract is mainly hilly and undulating and has numerous narrow valleys, two large plateaus: Kiraska and Kankwari, and two lakes: Manasarovar and Somasagar. Silisad Lake is situated along the north-eastern boundary of the reserve. The total area of the reserve is 800 km², of which 302.2 km² is a buffer zone and 497.8 km² is the core zone.

According to Champion and Seth (1968) the vegetation of Sariska comes under (1) Tropical Dry Deciduous Forest and (2) Tropical Thorn Forest. The dominant vegetation types include *Anogeissus* forest, *Boswellia* forest, *Acacia*-mixed forest, *Butea*-mixed forest, *Ziziphus* woodland, scrub land and riverine forest. The climate of this tract is subtropical, characterised by distinct winter (November to February), summer (March to June), monsoon (July to August) and autumn (September to October). In winter the temperature drops to 0° and in summer it rises as high as 47°. The average annual rainfall is around 600 mm.

Little previous work has been carried out on the avifauna of the reserve. Rodgers (1991) recorded 24 species of birds from Algal spring. KS stayed in Sariska from July 1988 to December 1990 studying the ecology of large herbivores. Birds were identified during this period and also during November 1986, November 1987, May 1988, November 1991 and February 1992. The most interesting finds were Painted Spurfowl *Galloperdix lunulata*, which had not been recorded previously from the arid and semi-arid tracts of Rajasthan, and Indian Cuckoo *Cuculus micropterus*, a rare straggler to the semi-arid tracts. The Aravali race of Red Spurfowl *Galloperdix spadicea caurina*, endemic to the Aravali hill range, is only found in a few localities.

SYSTEMATIC LIST

A total of 211 species was recorded, of which 120 were resident, 73 were migrant visitors and 18 were considered to be vagrants. In the list the following codes are used:

- R = resident
 W = winter visitor
 S = summer visitor
 M = monsoon visitor
 V = presumed vagrant
 ? = uncertain status
 B = confirmed breeding
 PB = probably breeding

- GREY FRANCOLIN *Francolinus pondicerianus* R, B. Abundant.
 BLACK FRANCOLIN *Francolinus francolinus* R, B. Rare - Karnakawas scrubland only.
 RAIN QUAIL *Coturnix coromandelica* R, B. Common.
 BLUE-BREASTED QUAIL *Coturnix chinensis* R, B. Rare.
 JUNGLE BUSH-QUAIL *Perdica asiatica* R, B. Abundant.
 RED SPURFOWL *Galloperdix spadicea* R, B. Rare - rocky areas near Pandupole, Siliberi and Slopka.
 PAINTED SPURFOWL *Galloperdix lunulata* R, B. Rare - rocky areas close to water, near Pandupole, Slopka, Udainath, Siliberi, Algal and Naldeshwar.
 INDIAN PEA FOWL *Pavo cristatus* R, B. Abundant.
 COMB DUCK *Sarkidiornis melanotos* R, PB. Rare.
 COTTON PYGMY-GOOSE *Nettapus coromandelianus* R, PB. Common.
 GADWALL *Anas strepera* W. Rare.
 COMMON TEAL *Anas crecca* W. Fairly common.
 MALLARD *Anas platyrhynchos* W. Rare.
 SPOT-BILLED DUCK *Anas poecilorhyncha* R, PB. Common.
 NORTHERN PINTAIL *Anas acuta* W. Fairly common in Silisad.
 NORTHERN SHOVELER *Anas clypeata* W. Common in Silisad.
 RED-CRESTED POCHARD *Netta rufina* W. Common.
 COMMON POCHARD *Aythya ferina* W. Rare.
 TUFTED DUCK *Aythya fuligula* W. Rare.
 SMALL BUTTONQUAIL *Turnix sylvatica* R, B. Common.
 BROWN-CAPPED WOODPECKER *Dendrocopos nanus* V. One near Sariska, November 1986.
 YELLOW-CROWNED WOODPECKER *Dendrocopos mahrattensis* R, PB. Rare.
 BLACK-RUMPED FLAMEBACK *Dinopium benghalense* R, B. Fairly common.
 COPPERSMITH BARBET *Megalaima haemacephala* W. Common.

- INDIAN GREY-HORNBILL *Ocyroceros birostris* R, B. Rare - only along the park boundary near Thanagazi and Malakera.
- EURASIAN HOOPOE *Upupa epops* R, B. Common.
- INDIAN ROLLER *Coracias benghalensis* R, B. Common.
- COMMON KINGFISHER *Alcedo atthis* R, PB. Rare.
- WHITE-THROATED KINGFISHER *Halcyon smyrnensis* R, PB. Common.
- PIED KINGFISHER *Ceryle rudis* R, PB. Rare.
- LITTLE GREEN BEE-EATER *Merops orientalis* R, PB. Rare.
- BLUE-TAILED BEE-EATER *Merops philippinus* R, PB. Rare.
- PIED CUCKOO *Oxylophus jacobinus* M. Common.
- COMMON HAWK-CUCKOO *Cuculus varius* R, B. Common.
- INDIAN CUCKOO *Cuculus micropterus* V. One seen near Kundli road, 23 June 1989; one heard, 3 July 1989.
- ASIAN KOEL *Eudynamys scolopacea* R, B. Rare.
- SIRKEER MALKOHA *Phaenicophaeus leschenaultii* R. Rare.
- GREATER COUCAL *Centropus sinensis* R, B. Rare.
- ALEXANDRINE PARAKEET *Psittacula eupatria* V. Seen only in November 1987, in three places between Sariska and Kalighati.
- ROSE-RINGED PARAKEET *Psittacula krameri* R, B. Fairly common.
- PLUM-HEADED PARAKEET *Psittacula cyanocephala* W, B. Fairly common.
- LITTLE SWIFT *Apus affinis* R, B. Common.
- BARN OWL *Tyto alba* R, B. Rare.
- INDIAN SCOPS-OWL *Otus bakkamoena* R, B. Rare - one heard, 12 November 1991.
- BROWN FISH-OWL *Ketupa zeylonensis* R, B. Bandipul stream.
- MOTTLED WOOD-OWL *Strix ocellata* R, PB. One at Slopka waterhole, 8 June 1988.
- SPOTTED OWLET *Athene brama* R, B. Common.
- SHORT-EARED OWL *Asio flammeus* W. Seen around Karnakawas, January to February 1989.
- GREY NIGHTJAR *Caprimulgus indicus* R, B. Common.
- ROCK PIGEON *Columba livia* R, B. Common.
- ORIENTAL TURTLE-DOVE *Streptopelia orientalis* V. One at Sariska, 15 June 1989.
- LAUGHING DOVE *Streptopelia senegalensis* R, B. Fairly common.
- SPOTTED DOVE *Streptopelia chinensis* R, B. Fairly common.
- RED COLLARED-DOVE *Streptopelia tranquebarica* R, B. Fairly common.
- EURASIAN COLLARED-DOVE *Streptopelia decaocto* R, B. Fairly common.

- YELLOW-FOOTED GREEN-PIGEON *Treron phoenicoptera* W. Fairly common - flocks of 30-50 birds seen feeding on *Ziziphus* fruits.
- SARUS CRANE *Grus antigone* W. Rare - one near Manasarovar, 12 January 1990.
- WHITE-BREASTED WATERHEN *Amaurornis phoenicurus* R, B. Not very common.
- PURPLE SWAMPHEN *Porphyrio porphyrio* R, PB. Rare.
- COMMON MOORHEN *Gallinula chloropus* R, PB. Rare - Silisad and Manasarovar.
- COMMON COOT *Fulica atra* W. Common - 60 on Manasarovar, 12 December 1990.
- CHESTNUT-BELLIED SANDGROUSE *Pterocles exustus* R. Common.
- BLACK-BELLIED SANDGROUSE *Pterocles orientalis* R. Rare.
- PAINTED SANDGROUSE *Pterocles indicus* R. Common in winter.
- BLACK-TAILED GODWIT *Limosa limosa* V. One at Somasagar, 10 March 1990.
- COMMON REDSHANK *Tringa totanus* W. Fairly common.
- COMMON GREENSHANK *Tringa nebularia* W. Common.
- GREEN SANDPIPER *Tringa ochropus* W. Common.
- WOOD SANDPIPER *Tringa glareola* W. Common.
- COMMON SANDPIPER *Tringa hypoleucos* W. Common.
- LITTLE STINT *Calidris minuta* W. Rare.
- TEMMINCK'S STINT *Calidris temminckii* W. Rare - one at Silisad, November 1986.
- EURASIAN THICK-KNEE *Burhinus oedicnemus* R, PB. Rare.
- BLACK-WINGED STILT *Himantopus himantopus* R, PB. Not very common.
- PIED AVOCET *Recurvirostra avosetta* W. Not very common - 20 on Manasarovar, 11 January 1990.
- LITTLE RINGED PLOVER *Charadrius dubius* W. Rare.
- KENTISH PLOVER *Charadrius alexandrinus* W. Rare.
- NORTHERN LAPWING *Vanellus vanellus* W. Rare - Silisad, 1988, 1989 and 1990.
- YELLOW-WATTLED LAPWING *Vanellus malabaricus* V. Two records from Udainath, July 1989.
- RIVER LAPWING *Vanellus duvaucelii* V. Silisad, November 1986.
- RED-WATTLED LAPWING *Vanellus indicus* R, B. Fairly common.
- BROWN-HEADED GULL *Larus brunnicephalus* V. One on Manasarovar, 14 January 1989.
- RIVER TERN *Sterna aurantia* R. Rare.

BLACK-BELLIED TERN *Sterna acuticauda* V. One at Kankwari, 10 April 1989.

WHISKERED TERN *Chlidonias hybridus* W. Rare - two near Kankwari, January 1989.

ORIENTAL HONEY-BUZZARD *Pernis ptilorhyncus* W. Rare - one in Bandipul, 12 December 1989.

BLACK-WINGED KITE *Elanus caeruleus* R, PB. Rare.

BLACK KITE *Milvus migrans* R. Rare - only two records near Udainath during monsoon and summer 1989.

EGYPTIAN VULTURE *Neophron percnopterus* R, B. Rare.

WHITE-RUMPED VULTURE *Gyps bengalensis* R, B. Fairly common.

LONG-BILLED VULTURE *Gyps indicus* R, B. Fairly common.

EURASIAN GRIFFON *Gyps fulvus* V. One near Sariska, November 1986.

RED-HEADED VULTURE *Sarcogyps calvus* R, B. Rare.

CRESTED SERPENT-EAGLE *Spilornis cheela* R, PB. Rare.

WESTERN MARSH-HARRIER *Circus aeruginosus* W. Rare - one near Silisad, November 1986.

SHIKRA *Accipiter badius* R, PB. Common.

EURASIAN SPARROWHAWK *Accipiter nisus* W. Seen very occasionally near Sariska, 1988 and 1990.

WHITE-EYED BUZZARD *Butastur teesa* W. More than 100 were seen around Karnakawas in 1989 when rodents were abundant; however, in 1990 very few were seen.

GREATER SPOTTED EAGLE *Aquila clanga* W. Rare - one near Kankwari, 20 November 1989 and one near Kalighati, 17 November 1991.

IMPERIAL EAGLE *Aquila heliaca* W. Rare - one near Karnakawas, 17 January 1990.

COMMON KESTREL *Falco tinnunculus* W. Rare.

ORIENTAL HOBBY *Falco severus* ? Rare - only in November 1986, in Sariska, Silisad and Kankwari.

LITTLE GREBE *Tachybaptus ruficollis* R. Common in winter.

GREAT CRESTED GREBE *Podiceps cristatus* V. Four seen on Manasarovar, 12 January 1990.

ORIENTAL DARTER *Anhinga melanogaster* W. Rare - 2-3 on Manasarovar and Silisad.

LITTLE CORMORANT *Phalacrocorax niger* R.

INDIAN CORMORANT *Phalacrocorax fuscicollis* R.

GREAT CORMORANT *Phalacrocorax carbo* R. Numbers of all three cormorants are augmented by migrants in winter.

LITTLE EGRET *Egretta garzetta* R. An influx of migrants in winter.